HPLC sampling protocol used at the Ubatuba ANTARES Station

Contact information:

Dr. Natalia de Moraes Rudorff
Laboratory of Satellite Oceanography
Remote Sensing Division
National Institute for Space Research (INPE)
Avenida dos Astronautas, 1754, São José dos Campos, SP, Brazil
Tel: +55 12 32086498

The ANTARES regional network is composed of coastal time-series stations located around Latin America (www.antares.ws). The main goal is to study long-term changes due to both climate and antropogenic effects, as well as, for ocean color purposes of satellite match-ups and algorithm development. The Ubatuba-ANTARES station is located in the Southeast Brazilian Bight (23°36'S; 44°58'W), 12 nautical miles from the coastline, at approximately 40 m depth (Figure 1). Ubatuba inner shelf is influenced by mesoscale cyclonic meandering of the Brazil Current (BC) system at a region with a crosscurrent transfer of slope waters into the shelf. This ecosystem is mainly oligo-mesotrophic, but also strongly influenced by the South Atlantic Central Water (SACW) upwelled locally or remotely forced from northeastern upwelling cores mainly during austral summer. In the winter, colder, less saline and relatively richer waters advects northwards along the shelf, from southern latitudes.

The data set submitted to SeaBASS includes monthly measurements of phytoplankton pigments for surface waters (1 m) collected at the Ubatuba-ANTARES station. The samples were collected from July 2012 to January 2013 (stations 89-95), following Hooker et al. (2005) protocol recommendations. A Niskin bottle was used for the collection of the surface water, which was stored in thermal bottles until the arrival at the laboratory in the main land (approximately 2 h after collection). The water samples (1-2L) were then immediately filtered using vacuum pressure (< 5 PSI) onto 25 mm GFF filters, during 20-40 min, in a dark and refrigerated room. The filters were transported in dry ice to the main laboratory in a nearby city (4-12h) and then stored in liquid nitrogen until the shipping date for the analysis.

The samples were processed by C. Thomas at NASA Goddard (Horn Point Laboratory), using High Performance Liquid Chromatography (HPLC) following Heukelem & Thomas (2001).

The samples were shipped from Brazil to the USA inside a cardboard-wrapped polystyrene container using dry ice to maintain the temperature below -75°C. However, an important note is that according to the person responsible to receive the samples, not much dry ice was left at its arrival, which may have affected the proper storage of the samples, causing some pigment degradation.

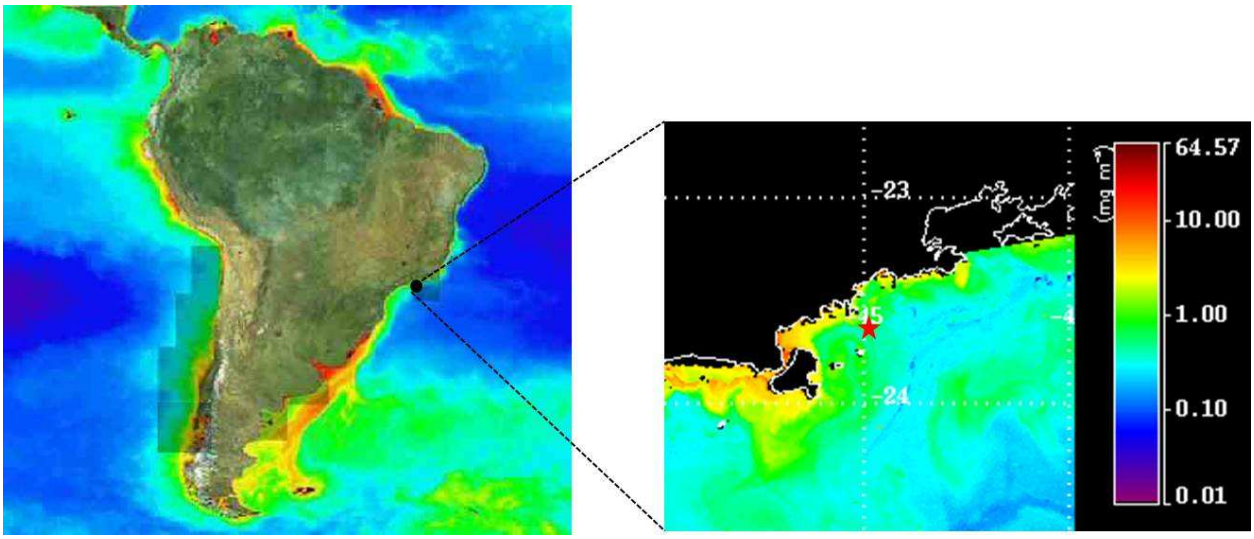

Figure 1: Chlorophyll a map showing the localization of the Ubatuba-ANTARES station in the South Brazilian Bight (red star). The map on the right was obtained using MODIS level 3 product (OCM3) for a daily composite of 07/18/2006.

References:

Hooker, S.B., Van Heukelem, L., Thomas, C., Claustre, H., Ras, J., Barlow, R., Sessions, H., Schlüter, L., Perl, J., Trees, C., Stuart, V., Head, E., Clementson, L., Fishwick, J., Llewellyn, C.A., Aiken, J. 2005. The second SeaWiFS HPLC Analysis Round-Robin Experiment (Sea-HARRE-2). NASA/TM-2005-212785.

VAN HEUKELEM, L.; THOMAS, C. S. Computer-assisted high-performance liquid chromatography method development with applications to the isolation and analysis of phytoplankton pigments. Journal of chromatography. A, v. 910, n. 1, p. 31–49, 23 fev. 2001.